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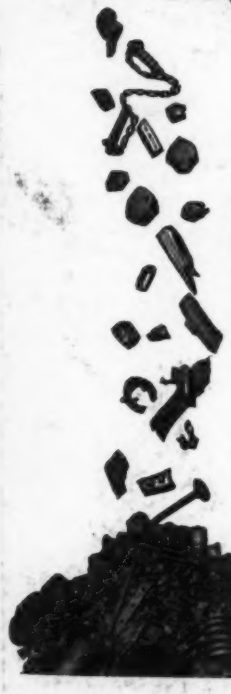

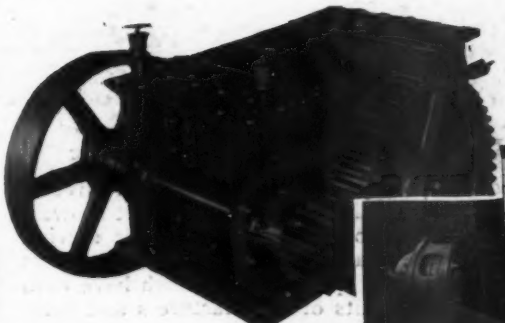

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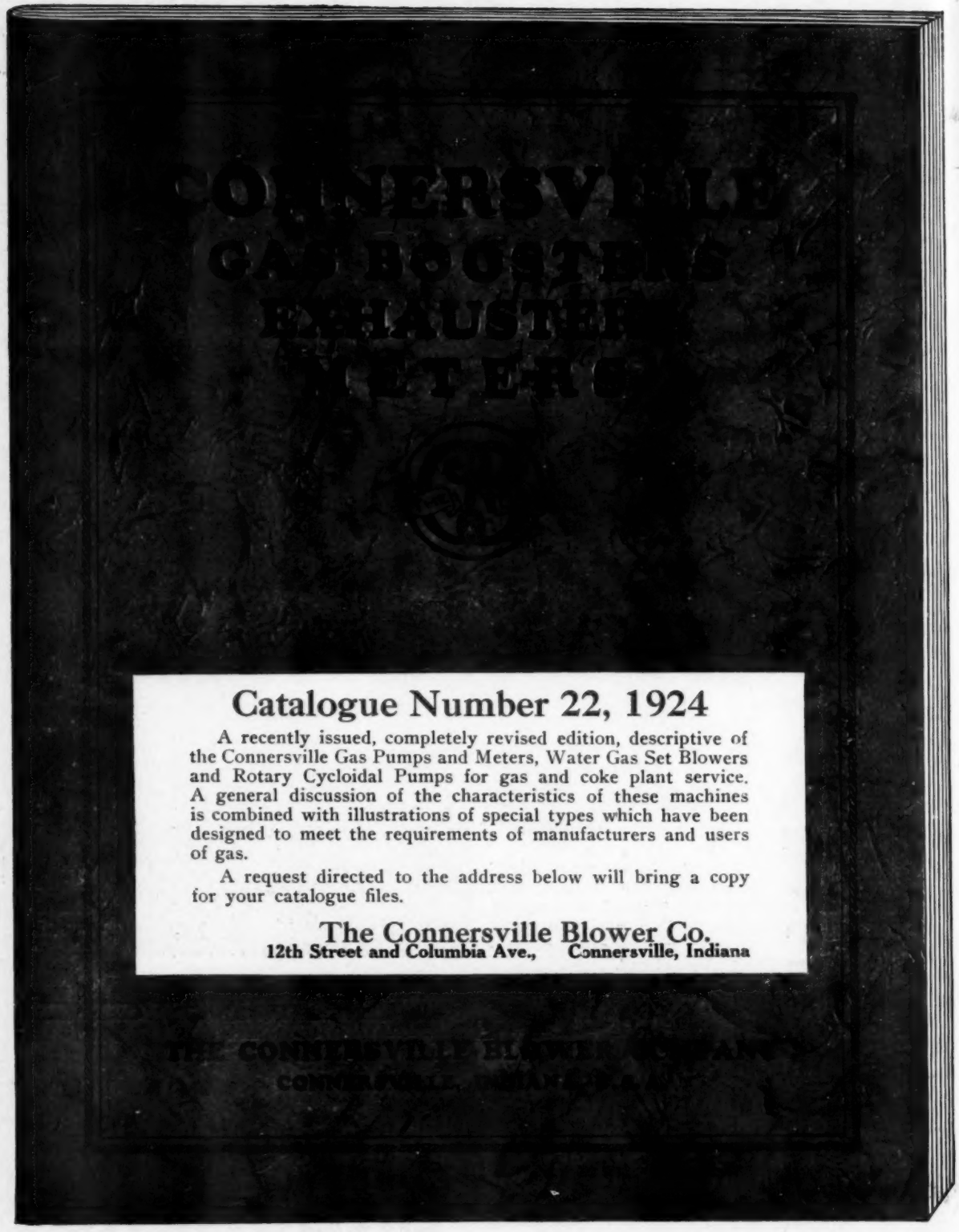
Index to Contents, Page 4

Advertising Index, Page 33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AMERICAN
GAS JOURNAL

Vol. 121. No. 21 NEW YORK, OCTOBER 25, 1924 Whole No. 3490

"Is Industrial Gas Business Prohibitive Because of an Incompetent Sales Personnel?"

Being the second of a series of articles attempting to correct the popular impression that the Industrial Gas business is not to be desired

A. B. Greenleaf

ONE of the most deplorable situations in the gas industry today is that scores of gas companies are, figuratively speaking, sitting on the side lines and watching tons of coal, gallons of oil and KW's of electricity being used in a field that fundamentally represents a highly attractive gas load. Take a mental inventory of the quantities of other fuels than gas burned in your city. By plain arithmetic convert this into cubic feet of gas. There is a potential gas load that many companies in their communities have found to be quite profitable.

Unbelievable

Why does this condition exist? Surprising as it may seem, one of the commonest reasons to be found is that these companies, neglecting industrial possibilities, are without a personnel qualified to go out and get this industrial business. A man operating a large candy factory in a modest Northwest city travelled hundreds of miles to a distant city in order to secure information relative to equipping his factory with gas appliances. When asked, after the interview with the industrial gas sales engineer, why he didn't consult his local gas company, he replied that he had and that they were entirely unable to furnish him with any kind of intelligent information on the subject.

Another Case

Another man had to use the long distance telephone to secure information relative to a standard industrial gas appliance that his local gas company had never even heard of! A large gas stove manufacturer in a pretentious little city used oil in his enameling ovens. The local gas company knew nothing about it until an outsider brought it to their attention. Imagine, this gas company was merchandising a considerable quantity of this factory's products while totally ignorant of the kind of fuel used in the manufacture of the ranges!

An Impression

If you were to investigate the reason why so many companies are not enjoying a profitable industrial gas load, you would soon find in case after case that it was because they lack the services of an industrial gas sales engineer. It is very true, however, that many of these companies have endeavored to secure such a man. After making one or two futile attempts to find a capable man, the idea of securing an industrial load is abandoned and the oil, coal and electric man prospers. The idea is quite prevalent that the industrial gas sales engineer can be procured as easily with the aid of a newspaper ad. as a bookkeeper, office boy or janitor.

"Such a Man Does Not Exist"

Mr. F. F. Cauley, who has probably hired more men for industrial gas sales work than anyone else in the country, recently said in a New Orleans address that, excluding those who have actually been employed in selling gas for industrial purposes, the industrial gas sales engineer does not exist. If you require a mechanical engineer, the technical schools will supply your needs. If it is an auditor you need, the business training schools will furnish the right man. But where is there a school turning out finished, accomplished, industrial gas sales engineers?

The industrial gas sales engineer must be made

right in the confines of your properties. It is not within the scope of this article to tell what this procedure should be. Nevertheless, it is imperative that the thought be brought out that in view of the expense of training and educating the competent sales engineer, he must and deserves to be well paid. This brings us to the first steps of our analysis of the fallacy that the industrial load is prohibitive be cause of an incompetent sales personnel.

Is the Expense Warranted?

Dropping, for the time being, all other questions but that of personnel, and supposing that your com-

Gas Fired Barrel Driers

pany has decided to convert all of the coal, oil and electric business on their lines to gas, it is quite evident that in order to secure this business an expenditure of money will be required. In one sense of the word it is like an investment.

Quite naturally, the question arises, "Would the probable industrial gas load in our city warrant the expense of the employment of an industrial gas sales engineer? The answer to this query all depends upon the size of the potential gas load in your vicinity. Why wouldn't it be a good idea to investigate and see just what your industrial gas load would be if all the "crude" fuel furnaces in your city were converted to modern gas burning appliances?

A Survey Needed

Almost a casual survey will give you the desired information. But if more specific information is required, and, indeed, it is advisable that it be secured, there are several easy methods of obtaining it. Make a list of all the manufacturers in your town. Go into each plant and determine the quantity of fuel used for each and every operation where heat is required. What is the heat used for? How is it used? How does it influence the finished product? Gather all this information with other pertinent data covering every heating operation carried on in each shop located in the territory covered by your franchise. You will also find places where heat could be used to advantage where at the present time no fuel of any kind is used. This is the first step.

Then Make Your Calculations

If there is no one in your organization capable of converting the "crude" fuel figures contained in your data sheets to cubic feet of gas and the consequent probable load you could obtain at your existing rates, send this material to one of the many gas companies that are enjoying a large industrial load. These companies are always more than willing to render whatever assistance they can and to enable others to profit by their past experiences. This is a practice that is being carried on and is greatly encouraged.

Certain industrial gas appliance manufacturers will analyze your potential industrial load with little or no obligation whatsoever. There are several ways of ascertaining just what the potential industrial load actually is in your territory. Of course, it is difficult to obtain all of this load at once. Part of it will be comparatively easy to obtain. It is essential that you determine what amount of industrial business you can obtain at the existing rates and conditions in the event you establish an industrial gas sales department.

(Continued on page 1119)

Gas Fired Keg Driers

The Use of Earthy Crude Lignite for Gas Making

A description of practical operations with this very low grade fuel

Dr. Karl Bunte

A Foreword

(The article which follows is concerned with a number of practical experiments, which were conducted on a large scale in the Frankfort gas works in Germany. This plant manufactures water gas and the purpose of the investigators was to determine if it were not practical to use a very low grade coal as a generator fuel. Hence, they used a crude lignite coal just as it came from the mine, contaminated with earthy matter and containing the moisture that is usually found in such coals. In other words, the coal was not prepared prior to its arrival at the gas works.)

This matter is of peculiar interest to the American gas man, not so much because the time has arrived where he will have to use such low grade fuels in the manufacture of water gas and semi-water gas, but simply because these investigations and the results that were obtained from them point out a way along which the American gas industry will eventually pass. There are large masses of lignite coal in this country and there are also large masses of soft coals, bituminous or sub-bituminous coals, which sooner or later will be employed on really large scale as generator and producer fuels. If such good results were obtainable in Germany with a very low grade of fuel, it stands to reason that even better results will be obtained with the fuels that are still not generally used as generator fuels in the manufacture of water gas, but which are far more plentiful and cheaper than those that are now commonly employed for this and other purposes. The article is translated from Das Gas und Wasserfach. —Editor.

MUCH interest has been expressed in German gas circles in the possibility of using crude lignite of the lowest grade for the generation of gas, and it was therefore thought advisable to institute a number of practical experiments to see whether or not that was practical. These tests were carried out in the Frankfort gas works. For the past few months this plant has been using such fuel for the generation of gas which is not sold to the public, but which is employed in heating the bank of retorts in which coal gas is manufactured for public consumption. The results that are described below were obtained from tests which lasted over a period of six days. As there are various kinds of brown coals or lignites that are mined and used for various purposes, the following results are given in such a fashion that the figures may be applied as well to other varieties of lignite than the one which was experimented with in this particular case.

Characteristics of the Lignite Used

The external appearance of the lignite coal that was used in these tests was distinctly earthy. Its consistency was such that it was quite easily rolled up into a ball. It contained a number of woody, lignite-like pieces about the size of a human head and also many smaller pieces. It also contained a number of clay-like lumps of the same size. The predominantly earthy character of the fuel made the storage piles of the same quite dense in structure. The comparatively few pieces of woody matter in the coal did not permit the fuel to break up into lumps and the clayey portions of the same had a rather disturbing action on the operation of the producer, as apparently they did not decompose in the fire, but burnt to give a hard mass.

The analysis of the coal was as follows:

Water	55.85 per cent
Ash	14.67 per cent
Combustible substance	29.48 per cent

Analysis of Combustible Matter

An analysis of the combustible matter in the coal showed it to contain 65.9 per cent of carbon, 5.71 per cent of hydrogen, 22.06 per cent of oxygen, 1.35 per cent of nitrogen and 4.98 per cent of sulphur. The heat of combustion of the same was 6,510 heat units per kilogram and the calorific power was 6,200 heat units per kilogram.

A sample of the air dried coal, containing 7.97 per cent moisture, was distilled, and the following results were obtained:

	Average Sample	Lignite part	Clayey part
Ash	58.0	48.5	74.2
Tar	12.8	16.5	6.8
Water	16.0	20.0	9.6
Gas (liters)	9.24	11.25	6.9
Gas (grams)	13.0	16.0	9.8
	99.8	101.0	100.4

The melting temperature of the ash is on the average 1,325 degrees C.

Description of the Experimental Installation

The producer that was used in this experiment consisted of a lower part in which the height of the jacket was 3.70 meters and the diameter of the shaft about 2.22 meters. There was provided a rotating grate of the ordinary construction and a cylindrical shaft above that of 2.85 meters height. There were eight peep holes for observing the progress of the gasification at various points in the producer. As can be seen from the figure, the lower part of the producer is larger in diameter than the upper part (see figure 1) and the upper part is provided with

an arrangement for feeding the fuel into the generator.

The upper part of the producer is thus built in such a fashion that there is a ring of coal between the part that extends down into the apparatus and the walls of the same. The operation may therefore be conducted in such fashion that the gases that are evolved in the lower part of the apparatus can penetrate through the annular ring of coal and pass through the same.

Speed of Gas Travel Increased

This construction is for the purpose of increasing the speed of the gas travel as it is produced, so that as much heat as possible is absorbed by the coal in the upper part of the apparatus. In this way this coal is dehydrated and a certain amount of distillation takes place with resulting increase in volume of the fuel. As indicated by the arrows in figure 1, the water vapor as well as the vapors of tar that are evolved in this part of the apparatus are immediately removed by being sucked towards the middle. Hence they need not travel through the main body of the producer. This also avoids the formation of tarry deposits in the interior of the machine.

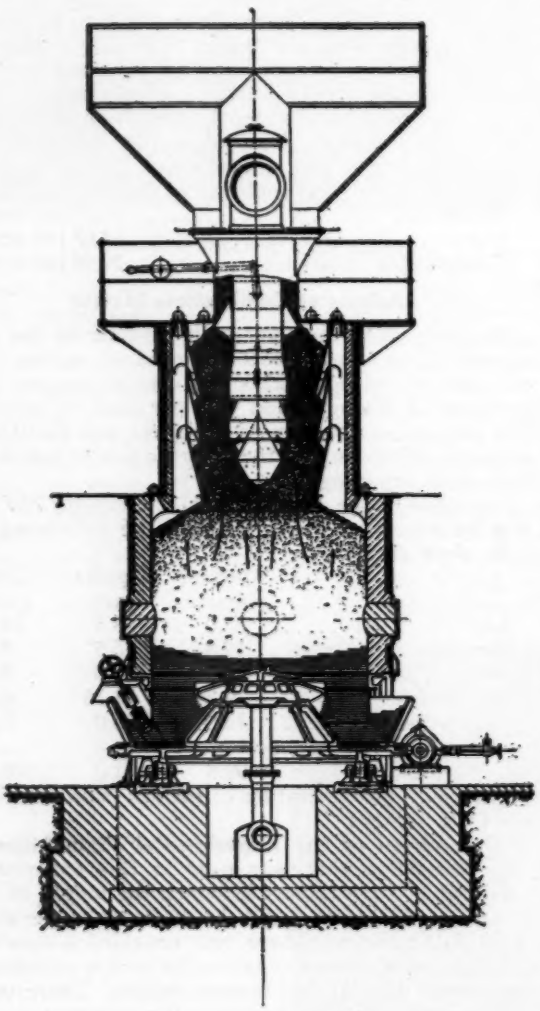

Fig. 1. The Producer-Generator

The gases in combination with water vapor and tarry vapors are sucked out of the apparatus by means of a suitable exhaust fan. They pass through a purifier in which the impurities in the gas are precipitated by impact with stationary blades. The gas then passes through a cooling device which is irrigated with water and is then fed to the furnace, where it is burnt.

The tarry matter which is removed from the gas in the impact purifier is pumped out of the same by means of a small pump. The duration of the test was not long enough to collect a sufficient amount of the tar to make an examination of it. The gas that is produced in this manner has been used for several months in this gas plant for heating the inclined retort furnace.

Results of the Experiment

The results of the experiment are summarized in the following tabulation:

Duration of the experiment	Six days
Consumption of crude brown coal during that time	56,780 kilograms
Heating value of the coal	1,500 heat units per kilogram
Yield of gas, at zero degrees C. and 760 millimeters pressure	70,300 cubic meters
Yield of gas per ton of crude coal used	1,238 cubic meters
Heating value of the gas at zero degrees C. and 760 millimeters pressure	808 heat units per cubic meter
Efficiency of the degasification process on the basis of heat obtained in the form of gas and that present in the original coal	66.7 per cent
Clinker, over 30 millimeters in size	2,875 kilograms
Combustible matter in the clinker	5.3 per cent
Clinker, under 30 millimeters in size	3,250 kilograms
Combustible matter in the clinker	16.2 per cent
Dust collected in the flues	251 kilograms
Combustible matter in the dust	44.2 per cent
Air fed to the generator	58,250 cubic meters
Water content of the air	235 grams per cubic meter
Steam used per kilogram of the crude coal	0.24 kilograms

Quantity of Gas Produced

In connection with these results, it is to be remarked that the quantity of gas has been determined

(Continued on page 1120)

The Right of a Public Utility to Advertise

It Should and Must for Its Own and Public's Interest

Leonard Ormerod

Vice-President, Public Utilities Advertising Association

I WANT to talk to you a little while about the right of a public utility, such as a gas company, a street railway company, a water company, an electric light and power company or a telephone company, to advertise.

What little I have to say is only my personal opinion. But my conclusions are the result of some experience as one of the great army of public utility employees, combined with an elementary knowledge of the principles of advertising.

The topic may seem a queer one in these days when advertising is so universal, yet the fact remains that not infrequently the question is raised as to the propriety of a public utility using generally approved advertising mediums to talk to its subscribers or consumers.

Perhaps the reason for this is that such utilities are very much under the eye of the government, both state and national, and properly so. That makes the question of their business practices of more general interest than that of a strictly private concern.

The Legal Aspect

If we want to discuss the "right to advertise" in a strictly legal sense, I submit to you that the question of an advertising policy and expenditure is a matter of management and not a matter of regulation. Somewhere there is a line which separates the responsibilities of regulation from those of management, and to me it seems obvious that the necessity and method of advertising are on the management side.

The money invested in our utilities is private capital. The management of those utilities is under obligation not only to give a good service to the public, but also to earn a fair return on that capital. Now if you are going to deny or even restrict the management from using business methods that are followed without question by strictly private corporations, you are going to establish a very dangerous precedent.

But I would not insist on the legal right of a public utility to advertise, or to do anything else, if it was not also sound management and good business to follow such a course. And so far as advertising is concerned it seems to me that not only has the public utility every right to advertise, but that it is under obligation to do so.

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*Delivered before the Sixth Annual Convention of the American Gas Association.

The Obligation to Advertise

Is it not proper that a utility should give an account of its stewardship to the public it serves? In various routine reports it gives municipal, state and national officers current information about certain phases of the business, but this does not meet the full requirement. The service of the public utilities is so necessary, so vital to the community that a more direct discussion of that service with the men and women dependent on it is necessary.

There are also sound business reasons why a public utility should use advertising to promote a wider understanding of its service and its practices, by what is known as institutional advertising.

In the first place it is easier and more economical to deal with a favorably disposed public than with one which, through lack of understanding, is inclined to be captious or critical. Such a lack of understanding means friction, and friction is always expensive, for it generates heat and wears out the machinery—human or otherwise.

Wisdom of Proper Public Understanding

In the second place, these public utility corporations are frequently the subject of legislative action or commission regulation, the legislators and commissioners acting as the representatives of the people. A wide understanding by the public is the best safeguard against any ill-considered action that might very easily result in injury to the service and a severe setback to the utility. In such an instance the public would be the principal sufferer, as it always is when any of these services are curtailed.

Still a third reason for a proper program of education is the constant necessity for most public utilities to add to their capital investment. There is only one place such new capital can be obtained, and that is from the investing public, which is, after all, the gas-using public, the telephone-using public, the street-car-riding public, etc. If this public has confidence in the management of its utilities it will be willing to invest in their securities. Lacking that confidence, such industries will find it difficult, if not impossible, to obtain necessary new capital at a reasonable rate.

It is with these points in mind that the story of our public utilities is being told everywhere. We do not expect the business man, whose time and at-

(Continued on page 1112)

*More House Heating Business

A Description of an Experience in this Field for Gas

G. I. Vincent

Syracuse Lighting Co., Syracuse, N. Y.

AT THE 1923 meeting of the American Gas Association I read a short paper entitled "This House Heating Business."

The meat of this paper was:

First, that the industry would acquire gas house heating whether it wanted it or not.

Second, that it was possible to modify existing coal equipment to operate efficiently under gas and that efforts could well be centered on hot air heating as it covered the very large majority of installations.

Third, that by reducing the heat losses and making the installation highly efficient, the gas demand could be held at a relatively low figure.

In the discussion, reasonably enough, some doubt was expressed or implied as to all three divisions.

At the time the paper was presented, the proposed design had never been tried, but, as I stated in the discussion, one was about completed following the identical lines suggested.

How Basic Data Was Secured

Data had been collected in preparation for the installation by taking the coal demand on the house selected for the trial through several very cold days in previous winters. This had been checked against the calculated heat loss and also the same data was secured in another similar house for checking. While admittedly very rough, it was considered sufficiently indicative to use as a base for the gas calculations.

It was calculated that with the house selected, if the heat loss could be reduced 20 per cent and the modified hot air furnace had an overall efficiency of 90 per cent, the gas demand would not exceed 225 cubic feet per hour with an outside temperature of 100 below zero. The design was predicated on these data.

The house selected was a standard frame, shingle roof, dwelling. Data on the building follow:

Outside dimensions without extensions	28x28 ft
Eight rooms and bath—cubical contents of first and second floors	12,242 cu. ft.
Cubical contents of basement	5,184 cu. ft.
Total side wall exposure above ground, including glass	2,784 sq. ft.
Area of glass exposure of first and second floors	670 sq. ft.
Area of glass exposure of basement	108 sq. ft.
Roof area	1,270 sq. ft.

Double doors and windows provided throughout, including basement. Ceiling of second floor insulated by laying an additional attic floor over hair felt between impregnated paper.

The Furnace Modification

Briefly, the furnace modification was as follows: The grates were removed from the furnace and cast iron bars installed carrying checker fire brick which filled the entire heating space. A triplex burner was installed on the floor of the ash pit, the three parts burning respectively 40, 80 and 120 cubic feet per hour. The header supplying these burners was controlled by a balanced valve operated by a thermostat of the usual dwelling heat regulator type. Between the furnace and the chimney the economizer was installed. In this device the products of combustion passes through cast iron wall radiators on the way to the chimney, the banks of radiators being enclosed by galvanized steel casing so that cold air from the basement floor flowed around the radiator and out through one large register near the center of the house. The cold air inlet to the furnace was removed and cold air openings made at the four corners of the first floor and a larger opening at the foot of the stairway. Therefore, all cold air drained from the first floor into the basement with no drafts.

The Burners

The burners were selected so that there could be six possible rates per hour, i.e., 40, 80, 120, 160, 200 and 240 cubic feet. With exception of short experimental periods, only the 120 or the 200 combination was used. At no time was more than 200 cubic feet per hour required.

Automatic humidifying equipment was installed.

Full recording instrument equipment gave all data.

Gas was 537 B.t.u. manufactured gas.

The thermostatic control was set to maintain the house temperature from 5 a. m. to 10 p. m. at 70 deg. F., and from 10 p. m. to 5 a. m. at 65 deg. F.

The Results

During the coldest weather, when the 200 cu. ft. per hour combination was used, the mean stack temperature was 88 deg. F. When the 120 cu. ft. combination was used, the mean stack temperature was 84.1 deg. F. In both cases the calculated overall efficiency was over 97 per cent. The coldest day was January 27, 1924, which reached a minimum of

(Continued on page 1114)

*Delivered at the meeting of the Commercial Section, A. G. A., Atlantic City Convention, Wednesday, October 15, 1924.

INDUSTRIAL GAS LESSONS

IF IT'S DONE WITH HEAT — YOU CAN DO IT BETTER WITH GAS

Lesson No. 42

Expansion Effect of Heat (continued)

Use of Table and Correction for Water Vapor Pressure

Take, for example, the case where 10,000 cubic feet of gas have been measured by passing through the ordinary type of meter. This is the volume of the total gas, all constituents inclusive of water vapor. The pressure at which the gas was metered was three inches of mercury. At the time of metering the temperature was 100 degrees F. and the pressure of the atmosphere was 29.5 inches of mercury. It is desired to know what the volume of the gas would be under standard conditions of temperature and pressure in the dry state. In other words, correction must be made for the water vapor that is contained in the gas and whose pressure is included in the total pressure of the gas, namely, three inches of mercury.

The first step is to make the temperature correction, that is, to reduce the volume of gas to the standard temperature of 60 degrees F. It will be recalled that the volume of the gas varies directly as the absolute temperature, this being found by adding 460 to the observed temperature. As the observed temperature is greater than the standard temperature, the numerator of the multiplying fraction must be less than the denominator. Thus the calculation will be as follows: $10{,}000 \times \frac{460+60}{460+100}$, or 9,286 cubic feet at a temperature of 60 degrees F.

Pressure Correction

The second correction is to reduce the volume of the gas to standard conditions of pressure, namely 30 inches of mercury.

In the first place, the reading on the mercury gauge is three inches of mercury, which means that this pressure was in excess of the atmospheric and in order to find the absolute pressure it is necessary to add thereto the pressure of the atmosphere at the time the reading was made. This pressure is given as 29.5 inches of mercury. Therefore, the absolute pressure at the time that 10,000 cubic feet of gas were metered was 29.5 + 3, or 32.5 inches of mercury.

Correction for Pressure of Water Vapor in Gas

Then, again, inasmuch as the quantity of dry gas metered is required, it is necessary to reduce this absolute pressure by the pressure exerted by the water vapor in the gas. From the table of aqueous vapor tension at various temperatures, it will be seen that the pressure exerted by the water present in the gas at the temperature of 100 degrees F. is 1.908 inches of mercury. Hence the net pressure is 32.5 — 1.908, or 30.592 inches.

To correct for the pressure change, the volume of gas must be multiplied by a fraction, which in this case will have a numerator that is greater than the denominator for the reason that the original pressure is greater than the final pressure. Thus, the volume of gas measured at a temperature of 100 degrees F. and reduced to the standard temperature of 60 degrees F. under dry conditions will be:

$$10{,}000 \times \frac{460+60}{460+100} \times \frac{30.592}{30}, \text{ or 9,470 cubic feet.}$$

COAL CARBONIZATION

This is the title of a book which has just appeared under the auspices of the American Chemical Society as Monograth No. 18 of the series that is being prepared and published by the Chemical Catalogue Company. The author of the book is Dr. Horace C. Porter.

The book contains considerable information on the subject of the carbonization of coal, not only from the technical aspect, but from the broad, economic aspect as well. The various systems employed in the carbonization of coal are described in detail. Considerable space is devoted to by-product coke ovens because of their importance in this field. Then, again, the fundamentals have not been neglected, the nature of coal, the mechanism of carbonization, the underlying principles of the cooling and scrubbing of vapor-carrying gases, and the transfer of heat through refractory walls into a subdivided loose lying mass of coal undergoing decomposition, receive much attention in this book, as well as other scientific phases of the subject. An interesting part of the book deals with a general discussion of the gas industry and its future.

As a whole, the book is admirably well written and gotten up and forms a valuable reference book on this subject which is of much importance to the gas men.

THE RIGHT OF A PUBLIC UTILITY TO ADVERTISE

(Continued from page 1109)

tention are already well taken up, to learn enough about his gas company to take charge of its chemical laboratory, or to become a telephone engineer. But many of us do believe and have proven that he is willing and anxious to be informed as to the sound principles which govern the establishment and maintenance of these and kindred services.

Why Are Utilities Small Advertisers?

Yet the fact remains that many of our public utilities are comparatively small advertisers. And it is doubtful even if the most liberal of them ever have gone far enough in this direction. What is the reason?

In the first place, some of the public utilities don't realize the importance of promoting a closer understanding with the community they serve. They think that good service is enough and speaks for itself. Certainly no amount of advertising can take the place of good service. But good service alone is not vocal enough. The Campbell Soup Company does not content itself with making a good soup. It gives you lessons on soup making through the advertising columns.

But what interferes seriously with a proper advertising policy on the part of many public utilities is the fear of being criticised for spending money in such a fashion. Unfortunately, there is some ground for that fear.

The Stamford Case

Many of you are familiar with the situation that developed a few months ago in Stamford, Connecticut, where the local gas and electric company was criticised in a petition signed by the Mayor, for spending money for advertisements which explained to the public certain points about the service. The petitioners took the position that the money thus expended should have been saved so that rates might be reduced. It is gratifying to know that the Connecticut Commission, in hearing the case, upheld the principle of advertising in a decision which said, in part:

> "This Commission has always advocated a proper amount of publicity on the part of utility companies in order that their patrons might be informed, in a general way, as to operating and financial conditions as affecting the rate payers. A fair and frank statement by a utility on controversial questions will assist in maintaining a relationship of good will and co-operation between the company and its patrons."

Not always, however, is the outcome so favorable. I want to quote you from a statement by another commission discussing the advertising policy of a telephone company. It follows:

> "This Commission is convinced that reasonable public announcement of changes in telephone equipment or in character of service, issuance of directories and necessary instruction in the use of telephone mechanism are necessary and proper for a public utility, but that advertising to justify rate increases or to defend the company's legal position in litigation is not justifiable when paid out of revenues."

In other words, I, as a telephone man, must say to you, as a subscriber: "The service for which you have been paying $5 up to this time will hereafter cost you $5.50, but I can't tell you why."

The Interest in Rates

Naturally enough, the public takes a keener interest in the rates of a utility than it does in anything else, not excepting the quality of service, and it would seem to me, as it does to many others, that it is not only the right of a public utility to set forth through proper advertising mediums the reason for rate changes, but that it is the company's duty to do so. And it should be criticised if it does not follow such a procedure.

Such a policy of restricted advertising as that just quoted would take away from a public utility a right which no one would question were it a private business.

Consider what it will mean if the advertising policies and programs of our public utility corporations are seriously curtailed. If such restrictions apply to telephone companies or gas companies, they apply with equal force to electric light and power companies, and even to railroads. The result would be most serious, I believe, to these utilities, and to the advertising profession generally.

The Cost

So far as the cost of a modest advertising program goes, it is negligible when divided among the total number of subscribers or consumers. For example, the sum spent for advertising last year by The Bell Telephone Company of Pennsylvania and Associated Companies, with which I am connected, amounted to but two cents per telephone per month. Had it been double that amount it would still have been too small to have made an appreciable difference to the subscriber.

I believe that any impartial investigator with a fair knowledge of our public utilities and a reasonable understanding of the principles of advertising will agree with me that it is sound economics for a public utility to advertise regularly; and that any phase of its business, whether it concerns service or finance, is a proper subject for free and frank discussion in its advertising copy.

As The Journal Views It

ATLANTIC CITY DAILIES

The Daily Editions of the American Gas Journal which were published at Atlantic City from Tuesday morning, October 14th, to Friday morning, October 17th, inclusive, as well as the regular issue of the Journal, dated New York, October 11th, which was also distributed at the Convention, were mailed to all the subscribers on the books of the American Gas Journal from Atlantic City each day of the issue.

We wish to call the attention of our subscribers to this fact as it may be that some of these copies did not reach their destination. If our subscribers will advise us immediately what issues they are missing, we will be glad to supply them with these issues as far as our supply lasts. We have a few copies available, and would urge those who have not a complete set of the Dailies to advise us immediately.

THE PRINCIPLES OF PUBLIC RELATIONS

It is only within the last few years that the gas industry, together with the other public utilities, has been paying particular attention to public relations. Since its activities started, however, there has been developed what may be called a real science dealing with the relationship existing between the public utility and its customers. The work done has been so extensive, and at the same time has covered so many fields, that it is now possible to say that the principles of public relations have been adequately defined. In other words, there has been developed a highly specialized field within the public utility, which is concerned with a phase of the public utility industry, possessing characteristics all of its own, and whose organization and operation depend on well-defined fundamentals.

In a recent issue of the American Gas Journal there was printed a discussion of public relations, the manner in which they may be conducted by the utility and the peculiar importance that this part of a public utility's work has on the welfare both of the community and the utility company. In this paper there was defined what may be called the principles of public relations.

It is always a sign of real development and of the substantiality of a field of endeavor, when it is possible to write down fundamental truths on which such work depends. In other words, it is generally true that a particular field of endeavor is first known by its practical application. Some individuals follow this line of work, and gradually as they attain experience, and as they read other experiences in the printed word, and as they exchange them with others engaged in similar work, there is gradually formulated a set of rules, regulations and fundamentals, or principles which appear to govern the results that are obtained in this work.

Public relations has reached this stage of its development. It may be called a well-defined science, and an important part of the public utility's work. Being of such character, it requires particular attention on the part of those who undertake this work, which means that the men who are part of the public relations organization of the gas utility, or of the other utilities, must be specially trained for the work. It cannot be undertaken haphazardly, and it cannot produce results unless those who undertake the work are well founded in the underlying principles that govern it.

Public relations work is unquestionably of prime importance to all public utilities. The results that it produces are directly transmittable into the well-being of the public utility. It should have in its control the regulation of all contact of any kind between the utility and its employees and the consuming public, and if this work is conducted with due consideration of the principles which have now been well established and clearly defined, the results obtained by the public relations organizations of the utilities will unquestionably be to the advantage of the entire industry.

MORE HOUSE HEATING BUSINESS

(Continued from page 1110)

minus 15 deg. F., with a mean during twenty-four hours of minus 4 deg. F. On one other day the mean temperature was just zero, with an average wind velocity of 40 miles per hour, which was a more severe day than the day with a lower temperature. On each of these days the demand of 200 cu. ft. per hour carried the load with entire satisfaction, there being a margin of nearly 100 per cent. That is, only a little more than half of 4,800 cu. ft. per day was burned.

The heating was very satisfactory, very noticeably better than when heated with coal. In fact, the heating had never been satisfactory with coal. In severe weather it had been impossible to be comfortable. This is a most interesting point. The same furnace which when burning coal failed to heat the dwelling, when modified to burn gas heated it perfectly.

Answering the questions that can well be asked as to this experiment:

First, was the installation like the design given in the original paper?

The thermostatic control of the chimney temperature, the by-pass around the economizer, and the damper at the bottom air inlet of the furnace, were found to be unnecessary. The over-ventilation of the burners was about 50 per cent. The efficiency was so very high that there was apparently no necessity for trying to better this figure.

Cost of Installation

How much would the installation cost?

The first one would be no criterion whatever. A design of economizer which is self-baffling and almost self-cleaning has been made to replace the cast iron wall radiators and has been put into limited production. With this economizer it is estimated that for $200 a complete installation could be made, not including the thermostatic control. This would allow a reasonable profit.

The Troubles Experienced

What troubles were experienced?

The anticipated troubles were condensation and corrosion of the flue connections. The latter were purposely made partly of galvanized steel, partly of steel pipe and, as above stated, of cast iron in the wall radiators. The cast iron was unaffected, the steel pipe slightly affected, but negligible for practical purposes, but the galvanized steel was almost disintegrated. Therefore, connections should preferably be made of cast iron at any point beyond the condensation temperature.

Condensation in a normal straight chimney would give no trouble, as it could be drained out of the base. In the experiment the chimney had a sharp angle just below the roof and condensation leaked through, which was corrected by straightening the chimney.

The original burners were entirely satisfactory from the combustion standpoint, but the ports were too large and the burners popped and were replaced with drilled bar burners with small drilling.

The second and third predictions which I repeated at the beginning of this paper have, therefore, been satisfactorily proved. The first is yet to come, but it does not need much optimism to realize that it is in sight.

HERE IS A MONEY-MAKING WAY

J. B. Dillon

Lots of people buying automobiles, gas ranges, and so forth, have a habit of purchasing a low-priced pattern, to "see if they will like the idea," and, finding that they do like it, decide upon securing a better pattern later. Of course, they want the old one to act as so much cash in the new purchase. This is one of the principal reasons why the second-hand car business has grown to such large proportions.

Is there any reason why the sale of gas ranges cannot grow to large proportions, both new and old?

Some dealers are getting into this business. Be sure, however, that the ranges are in good shape before you attempt such a "side line," because a "knocking" customer may do enough harm to kill the entire business.

Quite true, knowing people will not expect first grade patterns (new) at one-tenth of the cost, but, then, knowing people are those who have had experience and will buy the best.

The Profit

As to the percentage of profit to be made on the second-hand goods, it would seem that a minimum should be the desideratum, for obvious reasons, and it should be plainly stated at the outset to all prospective customers of these second-hand ranges that you are selling them at the low price more as an aid to people who are dubious as to the economy of using gas for cooking than for any other reason. By keeping the cost of the second-hand ranges as low as possible so as to make something you lessen the wail if there happens to be any. But there should not be any complaint if the range is properly repaired. All of this is necessary because a new first-class gas range needs no apologies; it is in a class by itself. It may be imitated, but never surpassed, for, remember, it does it cheaper, better and quicker than any other cooking heat known to culinarydom.

UNCLE SAM HAS LARGEST GAS-WATER HEATING PLANT IN THE WORLD

The largest gas water heating installation in the world has been purchased and installed by the Government in Washington to supply hot water for the 7,000 employees in the Navy and Munitions building.

Between each pair of the eight radiating wings that form the building a gas-fired heating plant has been set up, each plant consisting of a 1,000-gallon water tank and two heaters.

It is estimated that each worker in the Navy and Munitions building will use about two gallons of hot water a day to wash his or her hands, and the gas heating plant will accordingly be called upon to furnish a minimum of 14,000 gallons of hot water daily.

Catechism of Central Station Gas Engineering in the United States

Installment No. 42.

(Continued from last week)

Test points having been selected so as to cover the entire territory from the works to the outskirts in every direction, and the proper time for taking the observations determined, the territory is divided into districts, each of which contains only the number of test points that can be handled during the allotted time. These districts are then covered one after another and as nearly as possible on successive days.

The following description of a system employed where special pressure pipes are installed and recording gauges used is quoted from the answer of a member of the class:

"Pressure tests are made at least once a year of the entire system. In order to do this systematically there have been inserted at all important junctures of the main lines test pipes in the street with iron boxes set over them, similar to drip pipes, so it is convenient to remove a three-quarter inch plug and attach the gauge, a watchman being detailed at each gauge during the time it is set.

"The city is divided into districts which overlap each other to the extent of one or two locations. There are nine gauges set at a time, two of which will be on the same test pipes as were taken the previous day. This is repeated until the whole city has been covered. The lapping of the districts is to make comparisons of successive days as the consumption varies from one day to another.

"These tests are made at the time of maximum consumption, which is considered to be between 5:45 p. m. and 6.00 p. m. during November and December.

"The gauges used are the 'Bristol Recording' type and are set from about 4 p. m. to 8 p. m. each day until the whole city is covered."

Unaccounted For Gas and Actual Leakage Losses

225. Is it probable that all of the unaccounted-for gas reported by gas companies represents actual leakage loss from the holders, street mains and services? Give the reasons for your answer.

Ans. It is not probable that all the unaccounted-for gas reported by gas companies is due to actual leakage loss from the holders, street mains and services. In fact, there are many reasons for believing that a large part of the difference between the amount of gas indicated as made by the station meter and that indicated as sold by the consumers' meters is due to a difference between the temperature at which the gas is measured in the station meter and that at which it is measured in the consumers' meters, to inaccuracy of registration in the meters, and, where there are many street lamps, to an actual consumption that is in excess of the amount estimated.

The difference between the temperature at which the gas is measured in the station meter and that at which it is measured in the consumers' meters is an important factor in increasing the amount of unaccounted-for gas, especially if no correction for temperature is applied to the station meter registration. It is now quite customary to keep the temperature of the gas in the purifying boxes comparatively high in order to increase the efficiency of the purifying material, and this leads to the gas being measured in the station meter at a comparatively high temperature, averaging in some cases 70 degrees or over during the whole year. Consumers' meters are, as a rule, set in comparatively cool localities, such as cellars in residences and under show windows in stores, and as the consumption during cold weather is greater than that during warm weather, most of the gas is measured in the consumers' meters at a temperature much below that at which it is measured in the station meter. It is a difficult matter to obtain exact information as to the average temperature at the consumers' meters, but such tests as have been made show that, as a rule, there is enough difference between this temperature and that at the station meter to account for from 3 per cent to 4 per cent of the total make appearing as unaccounted-for gas, even though the registration is perfectly correct in each case.

Error in Registration of Station Meter

If there is any error in the registration of the station meter it is apt to be fast, since if this meter is slow the manufacturing results are made to appear poor and the cause is looked up and corrected; while if the meter is fast the manufacturing results are made to appear good, a state of affairs that is very readily accepted as being due to good management. On the other hand, the tendency in the case of the consumers' meters is to register less gas than is actually passed, owing to the stiffening of the diaphragms with age and to the development in the valves of leaks which permit gas used in small quantities, as for hall lights and lights kept burning at night, to pass through the meters without being registered. With a fast station meter and a number of slow consumers' meters the amount of gas unaccounted for may be quite large, even though the actual leakage is small. It is, therefore, important that both the station meter and the consumers' meters be tested at regular intervals so as to insure that they are registering accurately.

Where the street lamp burners are not provided with governors the consumption is very apt to be in excess of that called for by the street lighting contract, which is usually taken as a basis for estimating the amount of gas consumed by the lamps. This is especially the case where there is much difference in level between different parts of the district, or where the street main system is such that it is neces-

sary to have a great difference in pressure over part of the district between the hours of heavy consumption and those of light consumption, since in such cases it is impossible to avoid differences of pressure at the burner during different parts of the night, and it is usually necessary to have the consumption at the time of lowest pressure very nearly, if not fully, equal to the consumption specified in the contract, which makes the consumption during the time of higher pressure larger than is called for.

These points should always be carefully considered and their influence determined as far as possible when dealing with the question of a large amount of unaccounted-for gas. At the same time the influence of the actual loss from the holders and the distribution system should not be neglected.

Analysis of Unaccounted For Gas Losses

226. Having taken charge of the engineering work of a gas company showing a large amount of unaccounted-for gas, how would you proceed to determine how much of this was due to actual loss from leaks in the mains and services and how much was due to other causes?

Ans. A large amount of unaccounted-for gas might be due, apart from actual leakage from the mains and services, to inaccurate registration of the amount passing through the station meter, to an excessive difference in the temperatures at which the gas is measured in the station meter and the consumers' meters, respectively, to leaks in the holders, or to inaccurate registration by the consumers' meters owing to their being in bad condition. If much gas is used for street lighting, the use in the street lamps of more gas than is charged against them may also be an important factor in increasing the amount of unaccounted-for gas. It is, therefore, necessary to determine the extent to which any or all of the above-named conditions exist before the amount of gas lost by actual leakage from the mains and services can be known.

First Step in Investigation

The first step in the investigation would be to obtain accurate knowledge as to the temperature at which the gas is being measured in the station meter, and to apply the correction for volume necessary to obtain the measurement at the standard temperature suited to the locality. If no records are to be found of a recent reliable test the station meter should also be tested for accuracy of registration.

In the meantime the holders should be examined for leaks, and any that are found should be stopped as far as possible.

The records of the consumers' meters should also be looked up, and if, owing to the absence of any regular system of periodical testing, the majority are found to have been left untested for five years or more, arrangements should be made to bring them in as rapidly as possible for testing and for such repairing as the testing shows to be necessary. At the same time a search should be made for any meters that may be set and using gas without the record of their location showing on the books of the company. This, however, is only necessary when the records are in such poor shape that it seems probable that meters may have been set and not entered on the records, or may have been left out when transferring the records from one book into another.

The character and condition of the street lamp burners should be examined into, as well as the pressure conditions obtaining in the different sections of the town during the hours when the lamps are lighted. If the lamp burners are supposed to be using four or five cubic feet per hour, and the conditions are such that they are actually using eight to ten cubic feet, the extra consumption will materially increase the amount of unaccounted-for gas. This cause is sometimes sufficient to account for an apparent loss of four or five per cent of the gas made. It can be remedied by the use of either governor burners or checked burners suited to the conditions of pressure under which the gas is to be burned.

If the loss of gas still continues high after all these possible causes of a large amount of unaccounted-for gas have been investigated, and any of them that may have been at work to bring up the amount have been corrected, it will be necessary to charge the loss to actual leaks from the mains and services, and their condition should be examined into without delay.

Locating Leaks

227. Assuming that you had satisfied yourself that the distributing system of the gas plant under your charge was in bad condition as to leakage, how would you proceed to locate the leaks and put the system in good condition?

Ans. The leaks in a gas distributing system, unprovided with valves or other means of dividing it into sections, that can be isolated and tested for leakage separately and that is known to be in bad condition, may be located by a general "barring" over the mains without any preliminary division of the system into sections, or else this division may be made, each of the various sections isolated and tested for leakage and the "barring" confined to the sections that are shown by the test to be those in which the leakage is high. The making of tests of the actual leakage by the determination of the amount of gas lost from an isolated section, all the meters on which have been shut off for the time being, is becoming more and more difficult on account of the increasing use of gas for purposes other than that of giving light, which makes the shutting off of all the consumers in a district at any time during the twenty-four hours a cause of inconvenience and complaint. In such case, "barring" may be the only generally practicable method, but the testing by meter of at least such parts of the mains as can be isolated from the others conveniently and cheaply will give a good idea of the average condition of the mains and so help a decision as to the general cause of unaccounted-for gas, and also as to the parts of the system which it will be profitable to bar over and repair.

"Barring"

By "barring" is meant the driving of a pointed steel bar down to the main so that any leaks which may exist on the pipe at or near the points where the bar is used can be detected by the smell of gas that will be found in the holes left when the bar is withdrawn. To give good results, "barring" must be done systematically by a gang of men specially organized for the purpose. This gang should consist of at least five men, one being a caulker, who also acts as foreman, and the others laborers, who for part of the time do the actual "barring," and when leaks are discovered do the digging required to enable them to be gotten at and repaired. In the case of a large system it is advisable to use a larger gang, with a caulker in addition to the foreman and laborers to do the digging, the men assigned to the bars being kept steadily at that work. In the case of the smaller gang, the "barring" will be kept up until a sufficient number of leaks have been located and then it will be discontinued until all have been dug down to and repaired, while with the large gang, the "barring" and the digging are carried on simultaneously. Since the majority of the leaks that are not large enough to make themselves apparent without barring occur in the joints, and in many soils the gas from a small leak will not travel through the earth to a distance of more than two or three feet, the bar holes should be made directly over the main and as near a joint as possible. For mains 8 in. and over in diameter it is well to make two holes at each joint, one on each side of the main, as close to it as possible, the bars in this case being driven to the depth of the bottom of the main. This is advisable in order to detect leaks in the bottom of the joint, the gas from which will travel along underneath the main instead of working up around the sides to the top, and which thus would not be detected by a single hole driven down to the top of the main. To secure this result in the absence of detailed street main records showing the locations of the joints, the mains should be uncovered at each street intersection and the joints on the branches located, tested and repaired if found necessary. A line should then be drawn between each two adjacent locations thus found and the bars driven along this line at intervals equal to the distance between the joints. A convenient way of measuring off these intervals is to have a rope about 200 ft. long on which are tied pieces of red tape the proper distance apart. Having located the points, the holes are made by means of a bar of tool steel 1⅛ in. in diameter and about 5 ft. 6 in. long and tapered to a point, the taper extending for about a foot from the end. If the ground is soft, a bar 1 in. in diameter can be used, while if it is very hard on top a short bar about 2 ft. 6 in. long and from 1¼ in. to 1½ in. in diameter should be used to drive through the crust, the hole then being continued to the proper depth with the longer, lighter bar. With the small gang two bars can be used while barring, two men being told off to each bar. These men should be provided with either 6 pound or 8 pound hammers, according to the nature of the soil, with which the bar should be driven until it touches the main. When nearing the main the stroke should be made light, so that there will be no danger of cracking it with the point of the bar. If the bar should happen to be driven into the main, it will be necessary to dig down to the main, tap a hole of a convenient size and put in a plug. The depth at which the main is laid having been ascertained before starting to drive the bar, a mark can be made on the bar at the proper distance from the point, so that it will be known when the danger point is reached and the driving governed accordingly. When the bar is driven down as far as necessary it can be removed by striking each side alternately, to loosen it, and then lifting it, or a wrench may be provided by which the bar can be turned and raised.

Action After Withdrawing Bar

After the bar is withdrawn, the foreman should smell at the hole to see if any gas can be noticed. If none is noticed at first the hole should be left open for about ten minutes and then tried again, when if there is still no smell of gas it can be filled up by pouring dirt into it. If there is a leak at the joint or along the pipe near the hole, it will be apparent by the smell of gas remaining noticeable during the whole time that the hole is open. In such a case the point should be marked and dug up in due course. When a hole is opened at a joint in the main the previous measurements should be checked up to see that the holes already made come near the joints, and if it is found that these holes are over 2 ft. away from the joints new holes should be made according to the new measurements.

The nature of the repairs will, of course, depend upon the nature of the leak found. If it is in a lead joint the joint should be re-caulked, and if the lead drives back ¾ in. or more a new ring should be put in, or if the gang is equipped with a lead melting pot, the joint should be poured full and again caulked. Before pouring in any new lead the face of the lead already in the joint should be roughened up with a chisel, so that the new and the old lead will be well bound together. No lead joint should ever be pointed up with cement. If the leak is in a cement joint, the joint should be dug out to the first ring of yarn and made over again, using Portland cement and untarred yarn. Where the pipe is under block pavements the holes can be made by removing one stone at the proper point, this stone being set back in place after the hole has been tried and it is found that no leak exists. With asphalt pavements the top of the hole can be filled with Portland cement and smoothed off even with the surface of the pavement.

Record Taking

Records should be made and kept of the size of the main, its distance from the curb and its depth at every point where it is exposed, and these records should also give the location of every bell exposed in the course of repairs, so that in future it will be easy to see that the holes are driven at the right points to strike the joints. When "barring," the services should be barred over as well as the mains.

If it is decided that it is advisable to district the

system and isolate and test each district before barring, this can be done in the following way:

Selection of Districts

The sections should be so selected as to include the greatest amount of main with the fewest points of supply so as not to have to seal at too many points. The sealing may be done either by means of valves inserted in the mains at the proper points, by means of some of the various isolators on the market, or, if the districts are not intended to be permanent, simply by the use of bags. In using bags a good plan is to tap a slightly larger hole than is usual and put two bags into the pipe, one on each side of the hole. The space between the bags is then filled with water, which is kept level with the top of a nipple 3 in. long screwed in the hole. If the water runs out of this space very quickly the bags should be removed, the main wiped out with a bunch of waste on a stick and the bags put in again. If they still fail to make a tight joint with the pipe, instead of filling the space between them with plain water, a solution of oatmeal in water, which, being thick, will not flow through small openings so readily, may be used, or heavy lubricating oil may be poured in ahead of the water to answer the same purpose as the oatmeal. The section being sealed off all the meters in that district should be shut off, using the meter cocks instead of the street service cocks, if these are provided. A test meter should be connected up on a by-pass at the point where the largest supply main for the district is sealed and the amount of gas passing through the meter during fifteen minutes or half an hour noted, the readings of the meter being taken every five minutes to see whether the loss is uniform. Any great variation in the amount passing in different five minutes would indicate that gas was being consumed at some point in the district owing to some of the meters having been overlooked. If the loss is at a uniform rate during the test, a calculation should be made from the results obtained as to the loss per mile of main per year. If this is not more than 50,000 cubic feet per mile of 3 in. main per year the section can be passed for the time being, especially if the mains in it are laid under pavements. If the loss is greater than this, barring should be resorted to until the leaks are found and repaired and the section on the second test shows a leakage at a rate of less than 50,000 cubic feet per mile per year.

Repairing Leaks in Broken Mains

228. How would you repair a leak resulting from a broken main? Give a full description of the fittings used and the manner in which these fittings should be applied to the main in order to make the repair complete and permanent.

Ans. The main having been uncovered and the break located, the escape of gas should be stopped temporarily by pressing either clay or soap into the crack. The further procedure depends upon whether the break runs around the pipe so as to be all included within not over four or five inches in length, or extends longitudinally for a greater distince than this. In the first case the repair can be made with a split sleeve; in the second, the cracked piece must be cut out and a new piece inserted.

Using the Split Sleeve

When a split sleeve is to be used, all dirt and rust must be scraped off the pipe for a distance of a foot on each side of the break, and if the pipe has settled it must be brought back to the proper grade and alignment. A strip of unbleached muslin, wide enough to cover the break with a margin of three or four inches on each side and long enough to wind completely around the pipe several times, is smeared with a putty made of white lead, or equal parts of white and red lead and linseed oil, and wrapped tightly around the pipe over the break. Muslin which has been dipped in, and thoroughly saturated with, melted tallow and then allowed to dry, is also frequently used in a similar manner. This serves to entirely prevent the escape of gas while the job is being completed. A split sleeve, that is, a sleeve made in two pieces, each of them similar in size and shape to the pieces that would be obtained by splitting a solid sleeve along a plane containing both its axis and a diameter and provided with longitudinal flanges by which they can be bolted together, is then applied so as to cover the pipe at the break and for at least three or four inches on each side of it. The joint between the sleeve and the pipe can be satisfactorily made in various ways.

Making the Joint

One method is to plaster the inside of each half of the sleeve with a layer of Portland cement, mixed neat, of sufficient thickness to insure the complete filling of the joint and the compacting of the cement without allowing the flanges to come face to face when the two parts are put over the pipe and drawn together by means of the bolts. Enough cement should squeeze out through the spaces between the flanges to fill them thoroughly, but if this does not occur any unfilled places can be pointed up, so that, when the job is completed and the cement has set, the two halves of the sleeve are joined together with a gas-tight joint by the cement between the flanges.

Another method is to make the joints between the flanges gas-tight by using strips of millboard that have been soaked in hot water until they have become soft enough to be squeezed into all the roughnesses of the faces of the flanges when the two halves of the sleeve are put in place, surrounding the pipe, and bolted together. The joint between the sleeve and the pipe is then made exactly as would be done in the case of a solid sleeve, using either lead or cement. The latter is preferable, un-

(Forty-third Installment Next Week)

IS INDUSTRIAL GAS BUSINESS PROHIBITIVE, ETC.

(Continued from page 1106)

The Next Move

When this figure is once secured, it is a simple matter to determine whether or not it warrants the cost of a sales engineer. It is safe to say that in nine cases out of ten it most certainly does warrant the employment of a man who will go out and get this business.

Then comes the problem of securing the right man. Now that you have proved to your entire satisfaction that such a man is an asset to your company and a means of securing a very desirable increase in your business, careful thought should be given towards securing him.

Going After Business

The future of your industrial gas business depends to a large extent on how vigorously you go after this business and on the type of men you employ in this work. The field for industrial gas is in most cases a very large one. It is true that the industrial sales engineer is confronted with many problems. To be successful he must be a man with initiative and vision. He must have the power to analyze and his analysis must be based on good sound business principles. It is not an easy task. In fact, the work is very often hard, for in the majority of cases it requires careful study and considerable test work, sometimes extending over a long period, in the customer's own plant, in order to demonstrate to him in actual practice that it is to his advantage to use gas.

Education

A sound technical education is undoubtedly a wonderful advantage to the sales engineer in the field of industrial gas, but the confident, fighting plugger whose education has been limited but whose pride in himself and the organization with which he is associated is unbounded, will go far. It is the will to win and the desire of conquest that makes the real man.

The salesman with a thorough knowledge of his organization and his product is well equipped, but he must not limit his ammunition to this. A profound understanding of the customer's business and his various operations is a prerequisite in intelligently formulating a method of attack. The trade journals, manufacturer's catalogues, etc., offer a fund of information that should not be neglected.

The method of approach and subsequent contact with the prospect is important only to the extent of obtaining and sustaining his interest and eventually increasing it to the point where the final sale is made.

A salesman's ability successfully to interest the large manufacturers in gas as a source of heat for their industrial operations is primarily a question of his personal contact with the men in the shop and his method of presentation of the facts that he has found from his analysis of the operation under investigation.

A Large Modern Gas-Equipped Bakery (Courtesy of Ward Baking Co., Chicago, Ill.)

The Danger of Argument

All of the time and effort spent in the manufacturer's plant in carefully and impartially building up his case may be wasted and come to naught by an ill-timed statement or an unhappy, inconsequential argument. A possibly illiterate operator or foreman, unconsciously offended, may spoil months of hard work. Instinctive appreciation of the other man's viewpoint must be exercised with every member of the plant personnel with whom it is necessary to come in contact.

After a sale has been consummated, the equipment installed and in satisfactory operation, the job is not complete. Your customer, if he is to be the kind of client that we desire, must be now and continue to be a satisfied customer. He is entitled to your attention and confidence; he should be advised of the best method of current practice applicable to his condition and it is essential that he be induced to maintain his appliances in first-class condition.

The neglected customer is eventually a dissatisfied one and his source of complaint, however small, is a direct reflection, not only on the salesman, but, what is much worse, on the company's service. The customer should at all times be a friend, so well pleased with you and your company that both he and his equipment are a continual and outstanding advertisement for you and your company, its ideals and its service.

The Right Man

To secure such a man as is required for industrial sales work is, no doubt, a difficult matter. That, however, shouldn't be an alibi for not securing your industrial load. The right man may be in your employ right at the present time, working at a task of an entirely different nature. Possibly a mechanical engineering graduate or perhaps a chemical engineering graduate is the right man. He must, whomever it is, have confidence in himself, confidence in your company and confidence in the fact that gas is the ultimate fuel for industry.

Just because an ad. in a newspaper or trade journal does not produce the finished industrial gas sales engineer by no means indicates that the Industrial Gas Business is Prohibitive. It is quite probable that you will have to make the man you want right in your office, yourself. A man possessing a fair technical knowledge and some experience at selling, given a reasonable amount of latitude in your company and an opportunity to study the industrial gas business from all angles, will soon develop into that industrial gas salesman you have long wanted. If not, try again. Profit by your experiences in selecting the next man. In this way an industrial gas sales organization can be built and a really profitable industrial gas load obtained.

THE USE OF EARTHY CRUDE LIGNITE FOR GAS MAKING

(Continued from page 1108)

with real accuracy, not only in the holder, when exact observation of the temperature, the weight of gas and of the moisture was made, and in which determination there was also used a registering differential pressure meter, but for safety's sake the amount of the air that was fed to the producer was also measured in a holder and from this there was calculated the quantity of gas that would be obtained from the gasified carbon in the fuel. The percentage of carbon in the gas was also calculated in a similar manner. The two methods of control gave the following comparative results:

Volume of gas from the nitrogen in the air and the nitrogen in the gas itself,
72,500 cubic meters plus 3.1 per cent

Volume of gas from the gasified carbon and the carbon content of the gas,
71,900 cubic meters plus 2.3 per cent

The difference indicates an error in the holder measurement of approximately 2 per cent, which is not too high. The agreement between the results is as it should be, as it would be entirely accidental if the agreement were better. It must be remembered that the calculation is made while taking into consideration the loss of carbon in the clinker and the dust; this applies to both methods. Then, in the calculation of the carbon content of the gas, a certain correction is made for the carbon dioxide which is dissolved in the washer and thus removed from the gas before the latter reaches the holder.

The Calorific Value of the Gas

In order to secure accurate results, the calorific power of gas was determined in two ways. Direct determination of this property of the gas was made in the Junker calorimeter. A mixture of a number of samples of gas was employed and the result obtained was, on the average, 868 heat units. The average calorific power of the gas, which was obtained by calculation, using the percentage composition of the gas as determined by chemical analysis, was found to be 866 heat units per cubic meter.

The average consumption of coal was 56,780 kilograms within a period of six hours. This corresponded to a consumption of 9.5 tons of the crude brown coal in a period of twenty-four hours, or an average of 395 kilograms per hour. The quantity of coal passing through the producer per square meter of shaft area in a twenty-four hour period was 2.5 tons. The production of gas in a period of twenty-four hours was 11,700 cubic meters, and the production of heat during the same time was 9,243,000 heat units.

The Heat Balance

These figures on first sight do not seem to compare in any way with those that are obtained when the producer is operated with other fuels, such as coke, coal, etc. The only way to arrive at a true conception of what takes place and of the efficiency that is actually obtained in the operation of the producer with this low grade fuel is to strike a heat balance of the process. The following tabulation is arranged from results that were collected during the first five days of operation, the sixth day being excluded because of a change in the method of running the machine:

Heat brought into the system	Heat Units	%
Heat in the pure, clean coal, 46,980x0.2962	90,589,000	92.50
Heat in the steam that is fed into the generator, 0.235x48,250x 650.2	7,375,000	7.50
Total	97,964,000	100.00
Heat obtained from the system		
Heat in the gas, 57,810x868 (on carbon 55.4 per cent)	50,178,000	51.20
Combustible matter in clinker and ash, 476x8000	3,808,000	3.90
Combustible matter in dust, 88x8000	704,000	0.70
Evaporation of the water in the crude coal, 46,980x0.5585x633.5	16,622,000	17.00
Heat content of the gas, 57,810x 0.35x85	1,720,000	1.75
Heat content in the undecomposed steam, 0.24x46,980x633.5	7,143,000	7.30
Heat in the tar (about 2 per cent), 0.03x46,980x9,500	7,040,000	7.20
Loss in radiation (by difference)	10,749,000	10.95
Total	97,964,000	100.00

Discussion of Results

The loss due to radiation and conduction seems to be rather high, and this can be explained only by the fact that the test was such a short one.

As far as the loss of heat values in the clinker and ash are concerned, it may be mentioned that the gas-making machine was used in the experiment without any preliminary test to see how well it would gasify the carbonaceous matter fed into it, so that great care could not be taken to see that all of the fuel was converted into gas.

It must not be overlooked that the percentage of heat values lost in the tar, amounting to 7 per cent, was not based on the weight of the quantity of tar produced during the experiment. A separate condenser was rigged up to aid in the determination of this figure, but in spite of this the figure must be tken with a grain of salt. The only way to find the real quantity of tar produced in the system is to observe the same over a continuous period of operation. However, in a certain sense the above-mentioned figure is satisfactory.

The loss of heat values in the flue dust is of no significance. The presence of flue dust can, however, give rise to difficulties under certain conditions in the recovery of tar from the gas. It must, therefore, be mentioned that it is possible to reduce the flue dust to a very small proportion or remove it altogether by the use of a simple device. This dust catcher may be filled with slightly dried coal and works very efficiently.

Evaporation of Water in the Coal

The most important factor in the heat balance, besides the yield of gas obtained from the coal, is the evaporation of the water content of the crude coal. The entire problem of the gasification of crude brown coal or of any fuel which contains appreciable percentages of moisture centers around this point. In this case the consumption of heat, which must be regarded as a loss of heat values, amounts to 20 per cent of the total heat available.

Composition of the Gas

The following analysis of the gas is an average of a number of samples taken at different stages in the operation. Hourly control analyses were made and the results given below are the average of these control analyses. The figure for sulphuretted hydrogen was determined separately and that for nitrogen was found directly by the Jaeger method.

Sulphuretted hydrogen	0.5%
Carbon dioxide	14.5%
Carbon monoxide	8.5%
Oxygen	0.8%

The Installation Which Was Tested

Higher hydrocarbons	0.6%
Methane	0.7%
Hydrogen	12.7%
Nitrogen	61.7%
	100.0%

Character of the Gas

The gas may be called a mixture of producer gas, water gas and gas obtained by distillation admixed with air. A more detailed examination of the matter was made for the purpose of ascertaining what goes on in the generator. In order to arrive at some idea of how much distillation gas is contained in the product a quantity of the coal was distilled in a retort. Twenty-five grams were used containing 8 per cent water, and there were obtained 2.3 liters of gas (measured at zero degrees C. and 760 millimeters pressure), containing 45 per cent carbon dioxide. From 25 grams of water free coal there were also obtained 2.3 liters of gas, which means approximately a tenth of a liter per gram of coal or a tenth of a cubic meter per kilogram of coal. As the crude coal contains only 45 per cent of the dry substance, only 0.045 cubic meter of gas is to be expected from one kilogram of the coal. Therefore, on the whole, there was obtained per kilogram of coal only 1.24 cubic meters of gas, $\frac{70300}{780}$ of which only 0.045 cubic meter, or about 2.5 per cent, may be considered as gas produced by the distillation of the coal.

Analysis of the Formation of the Gas

When the composition of the distillation gas is taken into consideration, and when it is established that benzine is contained in the gas and corresponds to the higher hydrocarbon content of the same and that a certain proportion of hydrogen is formed in subsequent degasification, the analysis of the producer or generator gas may be split up in the following manner, to show how each step in the gasification process affected the final composition of the gas:

	Distillation gas	Benzine and after-gasification	Air	Combustion to OC_2	Formation of CO	Water gas	Total
H_2S	0.5	..	..	..	..	..	0.5
CO_2	1.6	..	..	12.9	..	..	14.5
Co	0.1	..	..	..	3.5	4.9	8.5
O_2	..	..	0.8	..	..	..	0.8
Benzine	0.1	0.3	..	..	..	..	0.4
CH_4	0.9	..	..	..	..	..	0.9
H_2	0.3	7.5	..	..	..	4.9	12.7
N_2	..	..	3.2	51.6	6.9	..	61.7
	3.5	7.8	4.0	64.5	10.4	9.8	100.0

In order to avoid any misunderstanding, it must be mentioned right at the outset that such a study of any gas must be based on somewhat arbitrary methods. The accuracy of the method used has its limits. However, it appears to be of some value in explaining the complicated processes that go on in the generator or producer. It shows in the first place that the part, which is played by the gas obtained by distillation in the carbon content of the producer gas, is only very small in this case where brown coal is used as the fuel. Furthermore, it shows that approximately between 60 and 65 per cent of the gas is to be considered as a combustion product to carbon dioxide and 10 per cent as a combustion product to carbon monoxide. Finally, it tells us that about 10 per cent of water gas is produced in the producer and the heat values of this gas, being added to the straight producer gas, which possesses only a low heating power, is of material aid in increasing the calorific capacity of the entire gas.

The Heat Tone of the Process

In considering this aspect of the process, the composition of the producer gas as it comes from the producer is used as a basis for calculating the thermal status of the process. The following results are then obtained:

Formation of carbon dioxide, 12.9x4337....	56,000
Formation of carbon monoxide, 3.5x1303....	4,400
	60,400
Formation of water gas, 4.9 $(C+H_2O)\times 1267$	4,940
Positive heat tone per 100 cubic meters.....	55,460

Calculating this on 1.24 cubic meters, which is the quantity of gas that is obtained from one kilogram of coal, we have the following:

$$\frac{55{,}460\times 1.24}{100} = 688 \text{ heat units.}$$

There were used 0.558 kilograms of water for vaporization, which required a consumption of 0.558×600, or 335 heat units. There then remained 688 — 335, or 353 heat units.

Heat Used in Drying the Coal

The heat that was consumed in drying the moisture out of the coal was also sensible heat that would have been available in the gas, had it not been used up in this manner. In the operation of the producer it was, however, surprising to find that steam was introduced under the grate in connection with air and blown through the bed of raw lignite coal. It is necessary to study what happened to that steam and from what follows it may be seen that this quantity of steam not only has no bad effect on the drying of the wet coal, but that it is also very essential to the operation of the producer.

The Effect of Adding Steam

According to actual measurements, it was found that for every kilogram of coal that was fed into the generator there were introduced 10.2 cubic meters of air ($\frac{58{,}250}{56{,}780}$). The percentage of water in the air

fed to the generator was determined by the dew point method. On the average during the first five days of the experiment it amounted to 235 grams, or 0.283 cubic meters of steam per cubic meter of air. Hence the average percentage of moisture in the air was 22.5 per cent by volume.

The amount of steam added per kilogram of the fuel was, accordingly, 0.24 kilogram, which is quite a high percentage of steam, as it figures out to be 0.54 kilogram per kilogram of the dry coal and 0.81 kilogram per kilogram of the pure coal.

Decomposition of Steam

Of this quantity of steam, only about 0.06 cubic meter is decomposed in the generator (1.24+0.05). This can be calculated when it is assumed that 10 per cent of the gas produced is due to the formation of water gas, as has been done about in reviewing the analysis of the mixed gas. Then 0.24 cubic meter $\left(\frac{0.243}{0.804} - 0.06\right)$ of water vapor per kilogram of coal is left undecomposed and is led away with the gas.

Hence the gas which is formed from one kilogram of coal must absorb before it leaves the generator the following amount of water vapor:

Undecomposed steam.....	0.24 cubic meter
Water evaporated from the coal....	0.69 cubic meter
Total per 1.24 cubic meters of gas	0.83 cubic meter of water vapor

This means a proportion of 40 per cent. The gas leaves the producer with a temperature of approximately 85 to 90 degrees, which is taken in the pipe line leading from the producer to the dust catcher at a distance of one meter from the former. The partial pressure of the water vapor at this temperature is from $\frac{434}{760}$ to $\frac{634}{760}$ millimeters, which means from 57 to 83 per cent by volume.

The fact that the temperature which is required to keep the moisture in the vapor form is maintained in the practical operation of the apparatus is attested to by the dryness of the dust that is recovered from the dust catcher. Hence the addition of the steam under the grate was so controlled at a temperature of 60 in the mixed steam and air that at an exit temperature of 75 degrees C. the coal in the generator is completely dried.

Efficiency of the Producer

The question arises what is the purpose, the function of the steam that is added in this manner. It is said to be essential to the successful operation of the apparatus, but it appears to be surprising at first glance that more moisture should be added to the system when so much already unavoidably enters it in the coal. The following observations were made to clear this matter up:

1. The coal must be dried by the gas. In order to avoid precipitation of the water in the gas, the temperature must be maintained high enough.

2. The coal is tumefied. This means the formation of tar in the producer and the formation of a tar-clinker zone. This can be avoided by increasing the quantity of the gases, so that percentage of tar in the total volume is small, and also by increasing the rapidity of the passage of the gas through the apparatus. The addition of undecomposed water vapor has the effect of diluting the percentage of tarry vapors in the gas.

The Clinker

3. The residue after distillation is clinker. The reactivity of this clinker is a very important point in the operation of the generator. Because of this high reactivity it is important not to have a thick bed of clinker and pass a hot blast through it. A thin combustion zone must be maintained. It is very inconvenient to maintain such a thin combustion zone in producers as it is easily disturbed by shaking the grate. But a stationary grate is not the best practice in producers that are fed with lignite coal. The action of the water vapor in this case is to dilute the gases so that reaction does not take place due to the reduction in the temperature that is brought about in this manner.

The Combustion Zone

4. From the reduction zone in the producer we now go deeper into the bed and reach the combustion zone. Mention has been made above of the high reactivity of the ash and clinker that are formed during the gasification of the lignite coal. This results in a high concentration of the combustion and hence this indicates that a high temperature will have to exist in the combustion zone. But it is now necessary to deal, not with lignite fuel, but with the ash and clinker, and if the temperature of the combustion zone is increased because of the limited area of this zone, there is great danger that the ash will fuse together.

Hence the addition of the steam to the air that is fed underneath the grate of the producer is of particular advantage in reducing the temperature within the combustion zone. The difficulties that arise from the melting of ash and clinker are too well known to require description here.

(Further details are given regarding the operation of the producer, but these cannot be reproduced here for want of space. The conclusion is reached from this experiment that it is commercially possible to burn crude lignite coal, containing as high as 55 per cent moisture, and obtain a fair gas from such fuel. This is an interesting matter to those who are considering the use of low grade fuels in the production of gas.—Trans.)

Current Market Prices

COALS (By Courtesy of Coal Age)
A. Bituminous.

(Spot prices, F. O. B., mines, net tons).

High Volatile, Eastern	Market	Price
Pool 54-64 (Gas Standard)	New York	$1.50 to $1.65
Pittsburgh screened gas	Pittsburgh	2.30 to 2.50
Pittsburgh gas, mine run	Pittsburgh	2.00 to 2.25
Kanawha lump	Columbus	2.35 to 2.75
Kanawha mine run	Columbus,	1.35 to 1.65
West Virginia lump	Cincinnati	2.75 to 3.50
W. Virginia gas mine run	Cincinnati	1.40 to 1.65
Midwest		
Indiana 4th vein lump	Chicago	3.00 to 3.25
Indiana 4th vein mine run	Chicago	2.25 to 2.50
South and Southwest		
Big Seam lump	Birmingham	2.75 to 3.25
Big Seam mine run	Birmingham	1.50 to 1.75
Southeast Kentucky lump	Louisville	3.25 to 3.50
Southeast Kentucky mine run	Louisville	1.50 to 1.75

B. Anthracite.

(Spot prices F. O. B. mines, gross tons),

	Market	Freight rates	Independent	Company
Egg	New York	$2.34	$9.25 to $9.75	$8.75 to $9.25
Egg	Philadelphia	2.39	9.25 to 9.75	8.80 to 9.25
Egg	Chicago (net tons)	5.06	8.17 to 8.27	8.14 to 8.20

COKE (By Courtesy of Iron Trade Review).

Connellsville, furnace	$3.00 to $3.25
Wise County, furnace	3.75 to 4.00
Alabama, furnace	4.50 to 4.75
Foundry, Newark, N. J., del	10.41
Foundry, Chicago, ovens	10.75
Foundry, Boston, delivered	11.50
Foundry, St. Louis	11.00
Foundry, Granite City, Ill	9.00
Foundry, Alabama	5.00 to 5.25

PETROLEUM (By Courtesy of Oil, Paint & Drug Reporter)

(Prices at wells, per bbl.)

Pennsylvania—Ohio—West Virginia.	
Cabell, West Virginia	1.45
Corning, Ohio	1.50
Lima	1.58
Pennsylvania	$2.75 to 2.85
Wooster, Ohio	1.40
Indiana—Illinois.	
Illinois	1.38
Indiana	1.39
Oklahoma—Kansas.	
Healdton	.90
Mid-continent (low gravity)	.85
Gulf Coast.	
Gulf Coast, Grade A	$1.25
Gulf Coast, Grade B	1.05

GAS OILS.

Gas Oil, Bayonne, bulk gal	5 to 5¼c
Gas Oil (32-36) Oklahoma, gal	3 to 3½c
Gas Oil (32-36) Gulf Coast, gal	3¾ to 4 c

PIPE AND FITTINGS—CAST IRON GAS PIPE.

(By Courtesy Iron Trade Review.)

Four-inch, Chicago	$59.20 to $60.20
Six-inch and over, Chicago	55.20 to 56.20
Four-inch, Birmingham	54.00 to 55.00
Six-inch and over, Birmingham	50.00 to 51.00
Four-inch, New York	69.60 to 71.60
Six-inch and over, New York	64.60 to 65.60
Standard fittings, Birmingham, base	115.00

6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20.

BY-PRODUCTS

(By Courtesy of Oil, Paint and Drug

Ammonia aqua, 16 deg. drums lb	5 to 5¼c
Ammonia aqua, 20 deg. drums lb	6¼ to 6½c
Ammonia aqua, 26 deg. drums lb	6½ to 7 c
Ammonia squa, anhydrous cylinder, lb	30 to 36 c
Ammonium sulphate, bulk F. O. B. Works, per 100 lbs	$2.60 to $2.65
Potash prussiate, yellow casks, lb	17 to 17½c
Potash prussiate, red casks, lb	37 to 38 c
Soda prussiate, yellow casks,	9¼ to 9¾c
Soda sulphocyanide, barrels, lb	45 to 55 c

COAL TAR BASIC PRODUCTS.

(By Courtesy of Oil, Paint and Drug Reporter)

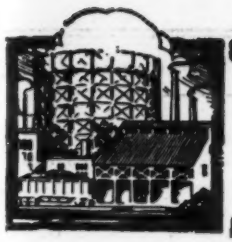
Benzol C. P. tanks, works, gal	24 to 25c
Benzol, drums, gal	30c
Benzol, 90% tanks, works, gal	23c
Benzol, 90% drums, gal	28c
Napthalene, flake, barrels, lb	4½ to 5 c
Napthalene, dyestuff bags, lb	4½ to 5 c
Solvent Naphtha, water white works, gal.	24 to 25c
Solvent Naphtha, drums, works, gal	29 to 30c
Toluene, C. P. tanks, works, gal	31c
Toluene C. P. drums, works, gal	36c

Coal

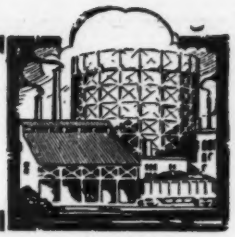
Bituminous coal output continues to increase slowly, production during the week ended October 11, according to the Geological Survey, totaling 10,548,000 net tons, a gain of 273,000 tons over the week ended October 4, when 1,275,000 tons were produced, according to revised figures. The rate of output now is not far behind that of 1923, though it is still far below that of 1920. Anthracite production rebounded sharply during the week ended October 11, when 1,737,000 net tons was the total compared with 1,425,000 tons during the preceding week.

Gas Oil

Gas oil was meeting with a better call, prices holding unchanged at a range of 5c to 5¼c per gallon, bulk, as to gravity.



NEWS OF THE GAS INDUSTRY



A PATRIOTIC DUTY

The Sprague Meter Co. Calls Attention to an Important Coming Event

The Sprague Meter Co., Bridgeport, Ct., are enclosing in all their mail a two-page folder, the front page of which is reproduced here-

STOCKHOLDERS MEETING
OF THE
U. S. A.
NOVEMBER
4
Attend and Vote!

Vote As You Please
BUT
VOTE!

with. On the inside is a table showing the number of votes cast in each state in 1912, 1916 and 1920, and also the number of eligible voters in each state that did not vote. It is a patriotic plea for every voter in the gas industry to vote, no matter who you vote for —but vote.

A Novel Exhibit at the Convention

The William M. Crane Company had a complete exhibit of hotel equipment, including heavy duty hotel ranges, broilers and bake ovens in their booths at the convention. Several new appliances, such as confectioners' and bakers' stoves, and a complete series of urn burners were also shown. They embodied the same principles of combustion and flame aeration as the standard ranges manufactured by this concern.

A novel feature in the booth was a special speed test arrangement which was used to determine the rapidity with which the new Quick Service Burner heated water up to the boiling point. An arrangement of thermometers was used to indicate the progress of the boiling, and when the boiling point was reached an electric bell was automatically rung. This interesting installation showed clearly the efficiency of this new development in range construction.

Standard G. & E. Co. Issues Booklet

A new 16-page illustrated booklet, just off the press, contains a great deal of interesting information regarding growth of Standard Gas and Electric Company and its operated public utility properties. Attention is called to the page of charts on the inside of the back cover; these figures are complete as of June 30, 1924, with comparisons extending back over a period of years.

George D. Cook Dies

George D. Cook, of the investigating department of the Public Service Company, Denver, died October 13 of acute indigestion, aged 55. Mr. Cook was a native of McKinley county, Texas. He is survived by his widow and five children. He was a Mason and an Odd Fellow.

New Gas Co. Incorporated

Albany, N. Y.—Upper New York Counties Electric Corporation, Gowanda, Cattaraugus county, has incorporated to supply electricity and gas for light, heat and power. Capital is stated at 2,000 shares preferred stock, $100 par value, and 10,000 shares common stock, no par value. Kenneth T. Young, Winchester, Mass., Harold R. Waldron, Gowanda, N. Y., and Donald W. Beebe, Arcade, N. Y., are directors and subscribers. Elton H. Beale, 1,429 Marine Trust building, Buffalo, is attorney for the corporation.

William B. Kopfer Made General Manager of Pueblo Gas and Fuel Company

His many friends will be glad to hear of the recent appointment of Mr. William B. Kopfer to be general manager of the Pueblo Gas and Fuel Company, Pueblo, Colorado.

Bill Kopfer is known to many in the gas business owing to his connections both in the manufacturing end and in the public utility field. He started with Henry L. Doherty & Co. in 1915, as a cadet, in Denver, Colo. Following this, he was transferred to the combustion department of the Combustion Utilities Corporation, in Caney, Kansas. Here Mr. Kopfer worked on the utilization of natural gas in the glass manufacturing and zinc smelting industries.

In 1918 the industrial heating department of Henry L. Doherty & Co. was organized in Toledo, Ohio, and the combustion department, previously mentioned, was absorbed by it.

He directed his attention at that time to the development of industrial gas and particularly to the investigation, development and sale of furnaces incorporating features of recuperation and regeneration.

In 1920, Mr. S. Tully Wilson, who had acted as general manager of the Improved Appliance Company from its inception by Mr. Henry L. Doherty in Denver, retired temporarily from business and was succeeded by Mr. Kopfer.

This company was well known to every gas company and may, indeed, be referred to as one of

the important pioneer concerns in the industrial end of the gas business.

It was decided shortly after this to make an amalgamation of certain of the Doherty Manufacturing Companies, and, as a consequence, the Improved Appliance Company was absorbed by the Combustion Utilities Corporation. In this latter company Mr. Kopfer acted as general manager of the utilization, or furnace and appliance division.

In the fall of 1922 he was transferred to another Doherty property, and as assistant general manager of the Atlas Chemical Company in Toledo, Ohio, was able to give freely of his very valuable experiences.

It is now, from the Atlas Chemical Company, that Mr. Kopfer has received the splendidly merited reward as general manager of the gas company in Pueblo, Colo. (another Doherty property).

We wish him every success and know full well that he will achieve it.

Springfield Gas Plans Improvements

Springfield, Mass.—The Springfield Gas Light Company is planning to spend about $800,000 on improving their service. The plans call for the moving of the gas plant from Springfield to Bondis Island and the building of a large pier into the Connecticut River at the new location.

Gas Rates Increased

Warsaw, Indiana—The Indiana Public Service Commission has issued an order authorizing the Warsaw Gas Company, serving the city of Warsaw and the town of Winona Lake, Indiana, to increase rates effective November 1, 1924. The new rates provide a monthly minimum charge per meter of $1.50.

For consumption charge the rates will be as follows: First 500 cubic feet, $1.45 gross, $1.35 net, flat; next 1,000 cubic feet, $1.95 per M. gross, $1.85 net; next 1,500 cubic feet, $1.75 per M. gross, $1.75 net; over 3,000 cubic feet, $1.65 per M. gross, $1.65 net. A seasonal minimum charge of $10 for customers using gas during the summer months of July, August and September only.

At the time of the hearing on the petition of the Warsaw Gas Company for permission to increase rates and a subsequent petition of the City of Warsaw for a reduction in rates, facts were brought out to show that the company was making improvements in the plant.

Upon completion of the improvements an affidavit was made by K. P. Hankins, general manager, at Warsaw, showing that $27,173.50 had been spent in making improvements, which included a new condenser building and wash room and extension to retort house; new three-quarter depth coal gas bench with Condon Scrubber system complete; new purifier, new rotary station meter and a new booster engine, as well as extensions to booster line to outlying sections of Warsaw and to Winona Lake.

The Warsaw Gas Company is a holding of the American Electric Power Company, Philadelphia, Pa., whose common stock has just recently been acquired by the American Gas and Electric Company of New York.

Huge Consolidation of Gas and Electric Utilities

Official announcement has been made that the Continental Gas and Electric Corporation, the Kansas City Power and Light Company, the Columbus Railway, Light and Power Company and the United Light and Power Company have been consolidated, the concern to be known as the Continental-United Power Company.

The Continental Gas and Electric Company began in 1912, but since that time it has acquired properties in Nebraska, Iowa, Kansas, Missouri and Ohio, having at present gross revenue in excess of $21,000,000.

The Kansas City Power and Light serves a population of about 575,000, furnishing all the current for electric light in the city of Kansas City, Mo., and surrounding towns in Kansas and Missouri.

The Columbus Railway, Light and Power Company does all the electric light and power business at Columbus, Ohio, with a few small exceptions, about 350,000 population. It also serves nearby cities.

The Lincoln Gas and Electric Company, which is one of the members of the Continental group, serves Lincoln, Nebraska, with gas and electricity, a population of about 80,000.

The United Light and Power Company is the owner of properties located in Iowa, Indiana, Illinois, Michigan and Tennessee. In that group are the cities of Davenport, Iowa, Rock Island and Moline, Illinois. Its gross revenue has increased from $6,000,000 in 1912 up to $12,500,000 at present.

The combined output of the merged companies is over 3,000,000,000 cubic feet of gas and about 340,000 K.W. of electrical current.

Combustion Utilities and Surface Combustion Combine

In March of this year Henry L. Doherty & Co. announced the acquisition, through Combustion Utilities Corporation, of the Surface Combustion Company, Inc., industrial furnace engineers and manufacturers.

Combustion Utilities Corporation has just announced the consolidation of the personnel and activities of its appliance and industrial furnace departments with those of the Surface Combustion Company, Inc. The greater organization, continuing under the name of the Surface Combustion Company, Inc., will be the utilization division of the Combustion Utilities Corporation.

Under the consolidation, Henry O. Loebell continues as president of the Surface Combustion Company, Inc.; E. E. Basquin, vice-president and general manager; W. M. Hepburn, vice-president; Frank H. Adams, treasurer, and E. M. Doig, secretary. Paul J. Nutting, formerly in charge of Toledo appliance division of Combustion Utilities Corporation, becomes vice-president in charge of production. C. B. Phillips, former sales manager, Toledo division, becomes vice-president and sales manager of the stock furnace division, which will include all the well-known "Improved" and "Utility" appliances and the "Blue Line" furnaces. F. W. Manker, previously in charge of Combustion Utilities' large furnace depart-

ment, becomes vice-president, and will be associated with Mr. Hepburn in the large furnace division.

The Surface Combustion Company, Inc., sales and general offices will be continued at 366-368 Gerard avenue, New York, and all production at the Toledo works, 2288 Albion street, Toledo, Ohio.

In commenting on this consolidation Mr. Loebell said: "This consolidation unites in one unit the utilization, engineering and sales personnel of these two organizations, so well known 'Wherever Heat is Used in Industry.' It brings to all industries the skilled services of the largest family of combustion engineers, whose skill is exemplified in equipment for the utilization of fuel with the utmost economy, but which makes for easier control. We will continue to forge ahead and force progress in efficient fuel utilization in industry, by providing a complete line of furnace equipment and a well-rounded organization to assist all industry in its great strides forward."

Empire Gas & Electric Petition for Franchise

The Empire Gas & Electric Company of Geneva has filed a petition with the Public Service Commission for approval of a gas franchise in the town of Phelps, Ontario county, and an electric franchise in School Districts 3, 4 and 8 of the town of Romulus, Seneca county. The company seeks permission to lay a high pressure gas line from its present line running from Phelps to Newark, to Clifton Springs. The company has obtained a franchise to supply Clifton Springs with gas for 50 years and it asks approval of the terms of the franchise. Consent of the town to the gas main was granted September 30. Consent of the town of Romulus to the proposed extensions of electric service in that town was given October 2.

IN MEMORY OF ALEXANDER H. STRECKER

Presented at the Meeting of the Society of Gas Lighting, October 9, 1924

Appreciating the loss suffered by the death, on August 25, 1924, of Alexander H. Strecker, the Society of Gas Lighting, at its meeting on October 9, 1924, adopts this minute in memory of him.

Alexander H. Strecker was born in the old city of Worms, on the Rhine, Germany, on September 24, 1847. His parents later removed to the larger city of Mannheim, in the schools of which he received his primary education. Graduating from these schools, he matriculated at the Polytechnic High School at Carlsruhe, at that time one of the foremost technical colleges in Germany.

His grandfather and father maintained a small gas plant for the supply of their own shops and dwelling, together with the other buildings in the immediate vicinity, all of which were situated outside of the city limits, so he became connected with gas manufacture early in life.

After leaving college, Mr. Strecker obtained a situation with an Austrian company which was building oil gas plants in which was utilized the oil recently discovered in Galicia and Rumania. He thus obtained experience in the erection of such plants in Austria and adjoining countries.

The military laws of Germany making it necessary for him to leave that country, he emigrated to the United States, arriving in New York in June, 1869.

His first position in the new world was with the long-established firm of Herring & Floyd of New York, iron founders, whose principal business was the manufacture and erection of apparatus for gas works, but early in 1871 he joined William Farmer, a well-known gas engineer, and one of the earliest members of the Society of Gas Lighting.

In May, 1872, Mr. Strecker was offered, and accepted, the position of superintendent of the Metropolitan Gas Light Company, supplying the portion of the then City of New York lying between Thirty-fourth and Seventy-ninth streets. For some years he had charge for this company of the distribution department and of holder construction and maintenance. Later he was made their engineer. When the consolidation of the New York gas companies was effected he retained his position in the new organization, but left in April, 1887, when he was offered, and accepted, the position of engineer of the Citizens Gas Light Company, which supplied the northerly part of Newark and the Oranges.

In 1895, when that company absorbed the original Newark Gas Light Company, Mr. Strecker became engineer of the resulting Newark Gas Company. Three years later, when other interests acquired the latter company, forming the Newark Consolidated Gas Company, he was retained as engineer of the latter company. In 1903, when the Public Service Corporation was formed, and absorbed or leased many of the street railway, gas and electric enterprises in New Jersey, Mr. Strecker was appointed engineer of its Essex Gas Division, which position he retained until the end of 1910, when he retired from active responsible work, although still retaining a limited interest in the technical management.

At the time of his death Mr. Strecker was, in length of membership, next to the oldest member of the Society of Gas Lighting, having been elected on February 26, 1885. Throughout the almost two-score years which passed between his election and his death he was a very faithful member, always ready to give of his time to serve the interests of the society. The appreciation by the other members of this faithfulness and his ability was shown by his election to the vice-presidency in 1910 and to the presidency in 1918. The latter office he held until 1922, when, because of his belief that it was for the best interests of the society, he refused the renomination which was offered him. He continued to serve, however, as a member of the executive committee.

Mr. Strecker had the high esteem, not only of the members of the society, but all who were associated in business with him, and especially of the younger men who worked under him during the early days of their training.

But it is as a friend that his memory will be longest and most highly treasured by all the members of our society, to whom his

friendship had been fully and freely given, and the friend will be missed even more than the active, efficient and faithful member and officer.

Alex. C. Humphreys,
E. H. Earnshaw,
Alfred E. Forstall, Chairman.

Short Course in Gas Meters at Iowa State College

The course will be held December 9-12, 1924.

The course is to be divided into two sections. One section to consist of men actually engaged in meter repair work and would consist of a series of demonstrations and lectures followed by actual bench work. The second section would consist of the distribution superintendents, managers and men not actually engaged in the repair of meters and would consist of papers presented on subjects relative to meter and distribution work. It was decided that the lecture and demonstration periods should be attended by men of both sections and that after these lectures and demonstrations in each class period the men in the first section would go to the benches for bench work and the men in the second section to another room for their papers and discussion.

It was decided that it would be necessary to hold a discussion and questionnaire at the end of each shop period on the work that had been covered by the previous lecture and shop period and the instructor would go over the work previously done and bring out any fault which he had noted in the bench work.

The Program

Tuesday morning, December 9, 10 to 11:30—Registration and assignment to classes.

Tuesday afternoon, 1:00—First lecture and demonstration covering the following subjects: Installation and Care of Prover, Proof of Meter from Service and Classification of Repairs Required, Care and Dressing of the Soldering Iron, Removing the Top of the Meter and Tinning the Parts.

Wednesday morning, December 10, 8:20—Lecture and demonstration No. 2, covering the following points: Remove the back plate, valves, horizontal axle and index; oil diaphragms, wash the gallery, grind the valves, test valve arms for lost motion and correct, test division of valves and correct, replace back plate, repack stuffing boxes, replace horizontal axle and index, test for binding, test division of flag arms and correct.

Wednesday, 1 p. m.—Lecture and demonstration No. 3: External pressure test, slow motion test and four-pointing, adjusting, putting on top, pressure test on top.

Thursday morning and afternoon—Iron case meters.

Tentative Papers for Second Section of Course

J. Howard Mathews, service engineer, Illinois Commerce Commission, will talk on "Meter Records."

Mr. Benish of Chicago will talk on "Measuring Gas in Large Volumes."

New Gas Rates for Adirondack Power & Light Company

Albany, N. Y.—The Public Service Commission has approved rates of the Adirondack Power & Light Corporation for gas service supplied in city of Saratoga Springs, N. Y., effective October 1, 1924, effecting changes as follows, in classification for all residence service where residence heating is effected wholly by gas fuel. Primary rate changed from $1.70 to $2 per M. cubic feet for first 500 cubic feet used per month per 1,000 cubic feet of building volume. Secondary rate changed from $1.10 per M. cubic feet for first 5,000 cubic feet of gas used per month in excess of that paid at primary rates; 85 cents per M. cubic feet for next 10,000 cubic feet, and 75 cents per M. cubic feet for all additional use per month, to the following: 70 cents per M. cubic feet for first 20,000 cubic feet in excess of that paid for at primary rate and 60 cents per M. cubic feet for additional use per month. Minimum charge heretofore computed for use of 500 cubic feet of gas for each 1,000 cubic feet of building volume, changed to: Computed for use of 500 cubic feet of gas for each 1,000 cubic feet of building volume for use during heating months of September to May inclusive and $1 per month for June to August inclusive.

The Gas Industry and the Red Cross

Frank W. Smith, vice-president of the United Electric Light and Power Company, 130 East 15th street, heads as volunteer roll-call chairman a special public utilities: gas, electric, traction group, to enlist the maximum response throughout the public utilities employees of New York City to the annual Red Cross roll-call opening, November 11, Armistice Day, for funds to maintain the organization's relief work and public health program. Mr. Smith served as chairman of a similar group in last year's roll-call.

The public utilities group is one of the first 75 groups formed in accordance with the campaign plan of committee organization of the city into various industrial, banking, mercantile and professional groups which will carry the roll-call appeal into every branch of industry. It is anticipated that by the opening of the roll-call more than 175 such groups will be functioning throughout the city, representing a total of some 1,400 volunteer chairmen and committeemen.

Plans for comprehensive activity throughout the group are already in operation under the leadership of Mr. Smith, and he has set as his goal a 100 per cent enrollment with a Red Cross button on every person in the public utilities lines.

Aid for the ex-service man and his dependents constitutes the major part of the Red Cross program in New York. More than $39,400 was expended last year in this work, which includes legal assistance, money loans, and medical attention, and a total of 4,500 cases were handled. Other outstanding metropolitan activities are the disaster relief and the public health program, under which more than 600,000 surgical dressings were supplied in the past 12 months to 16 local hospitals and which also covers nursing service, first aid and work in home hygiene and care of the sick.